

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.**

**GB 8901141  
SA 31518**

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 09/03/90. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A- 4062451	13-12-77	US-A-	3951893	20-04-76
		US-A-	4035540	12-07-77
US-A- 3756232	04-09-73	GB-A-	1334078	17-10-73
FR-A- 1572721	27-06-69	BE-A-	717074	24-12-68
		CH-A-	512199	15-09-71
		DE-A-	1760785	27-07-72
		GB-A-	1231648	12-05-71
		NL-A-	6808820	23-12-68
		SE-A-	348239	
FR-A- 2000556	12-09-69	BE-A-	727255	22-07-69
		CH-A-	515714	30-11-71
		DE-A-	1902695	27-11-69
		GB-A-	1236904	23-06-71
		NL-A-	6901079	24-07-69

# INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 89/01141

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) \*

According to International Patent Classification (IPC) or to both National Classification and IPC

**IPC<sup>5</sup>**: A 61 F 13/15

## II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC <sup>5</sup>	A 61 F
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched *	

## III. DOCUMENTS CONSIDERED TO BE RELEVANT\*

Category \* | Citation of Document,<sup>11</sup> with indication, where appropriate, of the relevant passages<sup>12</sup> | Relevant to Claim No.<sup>13</sup>

X	US, A, 4062451 (R.J.GANDER) 13 December 1977 see column 2, lines 34-63; column 5, line 34 - column 7, line 25	1-3,5-9, 12-17
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X	US, A, 3756232 (KOICHI NOGUCHI) 4 September 1973 see column 2, lines 32-52	1-3,5-9, 12-17
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X	FR, A, 1572721 (CELANESE CORP.) 27 June 1969 see the whole document	1-17
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X	FR, A, 2000556 (CELANESE CORP.) 12 September 1969 see page 9, line 5 - page 10, line 11	1-17
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\* Special categories of cited documents: <sup>10</sup>

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search  
**15th February 1990**

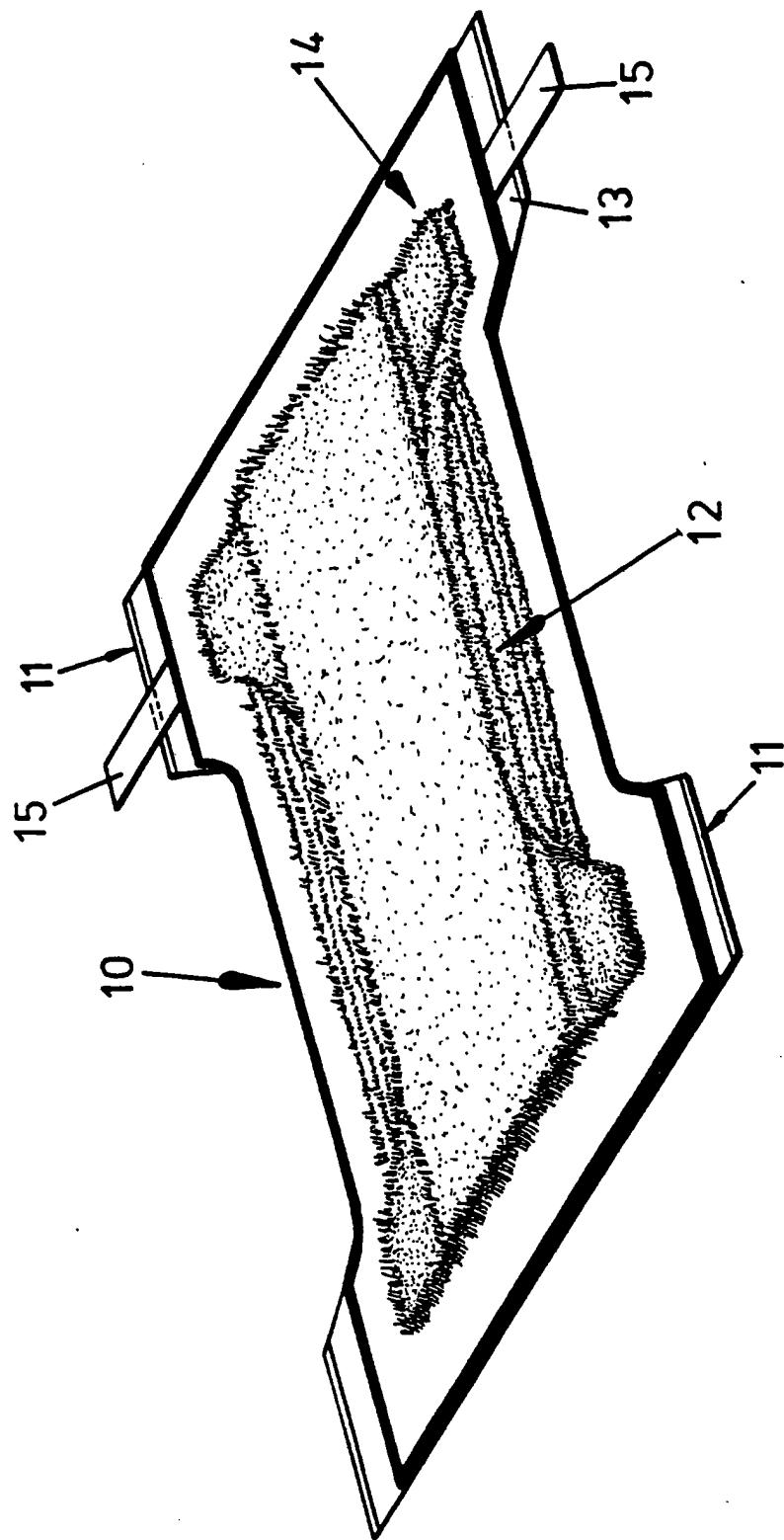
Date of Mailing of this International Search Report  
**14 MARCH 1990**

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Signature of Authorized Officer

**T.K. WILLIS**



for disintegration to occur.

12. A sanitary article as claimed in any one of claims 8 to 11 in which the disposable sheet, layer or liner is disposed of into a toilet bowl or other receptacle containing water or other liquid having sufficiently high alkali pH value, naturally or enhanced.

13. A method of disposing of a sanitary article, or liner therefor, in a non-health risk manner, the method comprising the steps of forming the sanitary article, or liner therefor, of an alkali-sensitive film or an alkali-disintegratable non-woven material, and disposing of the sanitary article, or liner therefor, into a toilet bowl or other receptacle containing water or other liquid either of a sufficiently high alkali pH value, or treated with an alkali pH adjuster to provide a sufficiently high alkali pH value to cause disintegration of the soiled sanitary article, or liner therefor.

14. A method as claimed in claim 13 in which the pH alkali value is 7.5 or more, and is preferably within the range 7.5 to 10.00.

15. A method as claimed in claim 13 or 14 comprising the step, when necessary, of enhancing the liquid pH alkali value to 7.5 or more by adding thereto a alkali pH adjuster.

16. A method as claimed in claim 15, in which the alkali pH adjuster is in the form of a toilet block, a tablet, a pellet, a capsule or liquid solution.

17. A method as claimed in claim 15 or 16 in which the alkali pH adjuster is one or more of alkali salts such, for example, as sodium carbonate, or caustic cleaners such, for example, as sodium or potassium hydroxide, or domestic bleach type formulations such, for example, as sodium hypochlorite, or detergents with alkali additive such, for example, as triethanolamine or ammonia.

18. A method as claimed in any one of claims 15 to 17 in which the alkali pH adjuster comprises a pH colour indicator whereby a visible indication will be given that the liquid or water has a sufficiently high pH alkali value

CLAIMS

1. A disposable article formed of a film or non-woven material which is inherently, or treated to be, alkali dissolvable or degradable.
2. A disposable article formed of, or treated with, acrylic copolymer resin or polyacrylic esters.
3. A disposable article as claimed in claim 2 in which the acrylic copolymer resin or polyacrylic ester is applied by coating, or integration with the disposable article during manufacture of same.
4. A disposable article as claimed in claim 3 in which the integration is effected by a co-extrusion process or a moulding process.
5. A disposable article as claimed in any one of claims 1 to 4 forming a sanitary article as hereinbefore defined, or part of such a sanitary article.
6. A disposable article as claimed in any one of claims 1 to 4 forming a packaging material.
7. A disposable article as claimed in any one of claims 1 to 4 forming an article of clothing, or part of an article of clothing.
8. A sanitary article including or consisting of a disposable sheet or layer constituted by a film of non-woven material which is inherently, or treated to be, alkali dissolvable or degradable.
9. A sanitary article as claimed in claim 8 in the form of a disposable diaper comprising a detachable, inner, next-to-body liner, preferably of non-woven material, having an alkali-disintegratable nature.
10. A sanitary article as claimed in claim 8 in the form of a liner for a child's potty or for a bedpan and formed of an alkali sensitive film or an alkali-disintegratable non-woven material shaped to conform with the inner configuration of the potty or bedpan.
11. A sanitary article as claimed in claim 9 in which the liner is in the form of an open-topped bag to receive and contain excreted body waste matter.

formed by coating or co-extruding the alkali soluble polymer onto a water soluble film such, for example, as polyvinyl alcohol or poly(ethylene) oxide.

The use of such a material instead of the presently non-soluble and non-biodegradable polythene used in diapers will permit a quick disintegration of the latter in refuse bags or sites.

The use of such alkali-sensitive film in disposable diapers may provide for full flushability of the latter down toilet bowls.

In summary, therefore, the present invention provides for the quick and safe (in terms of health and pollution) disintegration of disposable articles made from, or incorporating, alkali-dissolvable film or non-woven material in an alkali environment.

liner therefor, of an alkali-sensitive film or an alkali-disintegratable non-woven material, and disposing of the sanitary article, or liner therefor, into a toilet bowl containing water either of a sufficiently high alkali pH value, or treated with an alkali pH adjuster to provide a sufficiently high alkali pH value, to cause disintegration of the soiled sanitary article, or liner therefor.

A sufficiently high pH value is 7.5 and above and a preferred but not limitative pH value is within the range of 7.5 to 10.00.

Examples of other disposable articles within the scope of the present invention are packaging materials, and disposable articles of clothing especially those of a next-to-body nature.

An embodiment of the present invention will now be described, by way of example, with reference to the accompanying drawing which is a perspective view of disposable diaper.

The diaper 10 illustrated comprises an outer impervious layer 11 which is anatomically shaped, an intermediate liquid-absorbent layer or layers 12, a non-woven pervious cover layer 13, and an inner next-to-body pervious non-woven layer 14 which is detachable, being lightly tack-bonded to the layer 13. Securing tabs or tapes 15 are secured to both the outer impervious layer 11 and the cover layer 13 at one end of the diaper 10.

The inner layer 14 has a width not less than that of the crotch region of the diaper, is equal to the length of the diaper, and is preferably also anatomically shaped.

The layers 11 to 14 can be laminated together during an in-line manufacturing process or alternatively layers 13 and 14 can be tack-bonded in an off-line process.

The inner detachable layer 14 is, as aforesaid, formed of a suitable alkali-disintegratable non-woven material and is adapted for disintegration disposal in alkali-enhanced water in a toilet bowl.

The disposable article, of whatever nature, may be

disposable articles of clothing especially those of a next-to-body nature.

More specifically, the sanitary article may be a disposable diaper comprising a detachable, inner, next-to-body liner, preferably of non-woven material, having an alkaline-disintegratable nature.

Alternatively, the sanitary article may be a liner for a child's potty or for a bedpan and formed of an alkali sensitive film or an alkali-disintegratable non-woven material shaped to conform with the inner configuration of the potty or bedpan.

The liner may be in the form of an open-topped bag to receive and contain excreted body waste matter.

Such liners may, as aforesaid, be disposed of into a toilet bowl for disintegration and flushing away with associated body waste matter.

If, as would be usual, the water in the toilet bowl does not have a sufficiently high alkali pH value then this is corrected by adding to the water a suitable alkali pH adjuster.

The alkali pH adjuster may, inter alia, be in the form of a toilet block, a tablet, a pellet, a capsule or a liquid solution.

Convenient alkali pH adjusters are, inter alia, alkali salts such, for example, as sodium carbonate, or caustic cleaners such, for example, as sodium or potassium hydroxide, or domestic bleach type formulations such, for example, as sodium hypochlorite, or detergents with alkali additive such, for example, as triethanolamine or ammonia.

The alkali pH adjuster may comprise a pH colour indicator whereby a visible indication will be given that the water in the toilet bowl has a sufficiently high pH alkali value for liner disintegration to occur.

Also according to the present invention there is provided a method of disposing of a sanitary article, or liner therefor, in a non-health risk manner, the method comprising the steps of forming the sanitary article, or

DISPOSABLE SANITARY ARTICLES

This invention relates to disposable articles and is especially but not exclusively concerned with disposable sanitary articles.

Sanitary articles include, inter alia, diapers, sanitary towels or similar, liners for childrens' potties, bedpans and bedsheets and any other article provided to receive bodily excretion.

The substantial and increasing use of disposable articles is a major concern to local authorities in particular, and environmentalists in general, in terms of health risk and pollution.

In its broadest aspect the present invention provides a disposable article formed of a film or non-woven material which is inherently, or treated to be, alkali dissolvable or degradable.

The disposable article may be formed of, or treated with, acrylic copolymer resin or polyacrylic esters.

The treatment may be by way of coacting or integration with the disposable article during manufacture of same, for example extrusion or moulding or any other process known to those skilled in the art of material treatment.

Also according to the present invention there is provided a sanitary article including or consisting of a disposable sheet or layer constituted by a film or non-woven material which is inherently, or treated to be alkali dissolvable or degradable.

The soiled sheet or layer may be suitable for disposal in refuse bag or sites where it disintegrates.

Alternatively the sheet or layer and any associated body waste matter may be disposed of into a toilet bowl where it disintegrates and can be flushed away with the body waste matter.

Examples of other disposable articles within the scope of the present invention are packaging materials, and

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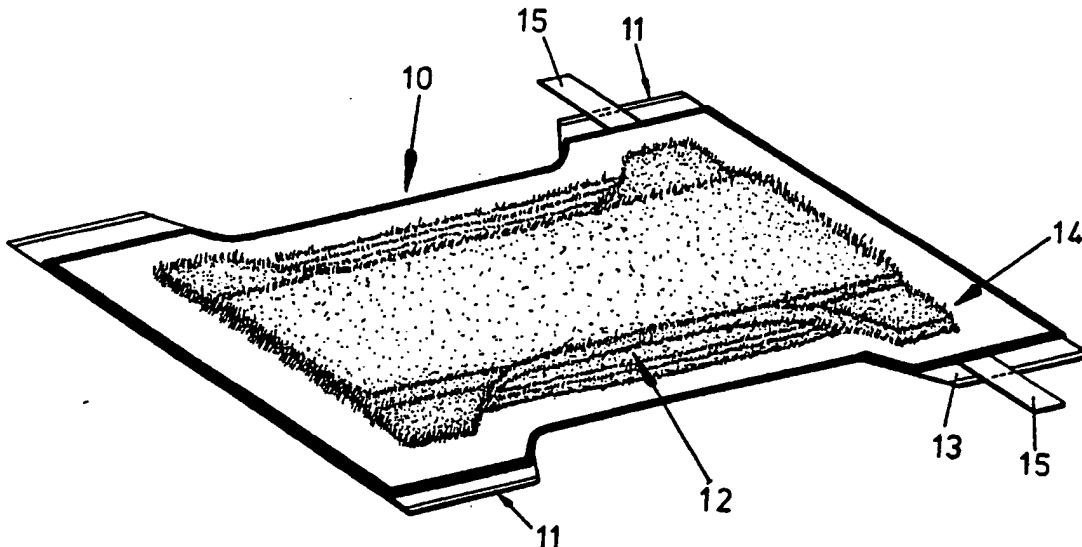
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(75) Inventor/Applicant ( <i>for US only</i> ): SHIPLEY, Roger [GB/GB]; Ball, 12 Essex Avenue, Didsbury, Manchester M20 0AN (GB).		<i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
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(54) Title: DISPOSABLE SANITARY ARTICLES



(57) Abstract

A disposable article is formed of an alkali-sensitive film or an alkali-disintegratable non-woven material and is adapted to dissolve in an alkali environment, which may be liquid, having a sufficiently high alkali pH value, say 7.5 or more. An example of such an article is the inner, next-to-body, liner of a disposable diaper which can be disposed of in a toilet bowl with contained body waste matter, the liner disintegrating so that it can be flushed away with the latter. If necessary, the pH alkali value of the water in the toilet bowl can be enhanced by a pH adjuster. Such disposable articles remove health and pollution risks.